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Abstract

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PI Name: KIM, SHANN D.

PI Title:

Project Title: SLOW MYOSIN LIGHT CHAIN:NEURAL AND MECHANICAL REGULATION

Abstract: *DESCRIPTION Neural activity and mechanical load have been shown to be important physiological stimuli that regulate skeletal muscle phenotype in the adult animal. The phenotype changes have been well characterized, but little is known about the molecular mechanisms through which these stimulate regulate the contractile protein genes. The long-term objective of this study is to determine the neural- and mechanical load-dependent mechanisms that regulate the myosin light chain-2 slow (MLC2slow) gene. The specific aims: 1) to identify the proteins that form transcription factor complexes at critical promoter sites of the MLC2slow gene with neural activity and mechanical loads, and 2) to determine the mechanism(s) by which extra- and intracellular calcium modulates the function of specific transcription factors in vitro. This proposal will combine an in vivo models of muscle regeneration and in vitro methods to identify important factors and pathways involved in the physiologic regulation of the promoter of the MLC2slow gene. This study is significant because in addition to their important role in muscle biology, the contractile proteins have been implicated in the other cell events, such as the maintenance of cell architecture and morphology. At an applied level, muscle regeneration occurs following muscle damage from mechanical, thermal, or metabolic stress, in addition to its association with dystrophic muscle pathologies.*

Thesaurus Terms:

calcium, genetic regulation, myosin ATPase, neuroregulation, protein structure, protein structure function, transcription factor
genetic promoter element, nucleic acid sequence

autoradiography, confocal scanning microscopy, laboratory rat

Institution:	UNIVERSITY OF ILLINOIS AT CHICAGO AT CHICAGO CHICAGO, IL 60612
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